

Pyramid Comet Sampler, Phase II

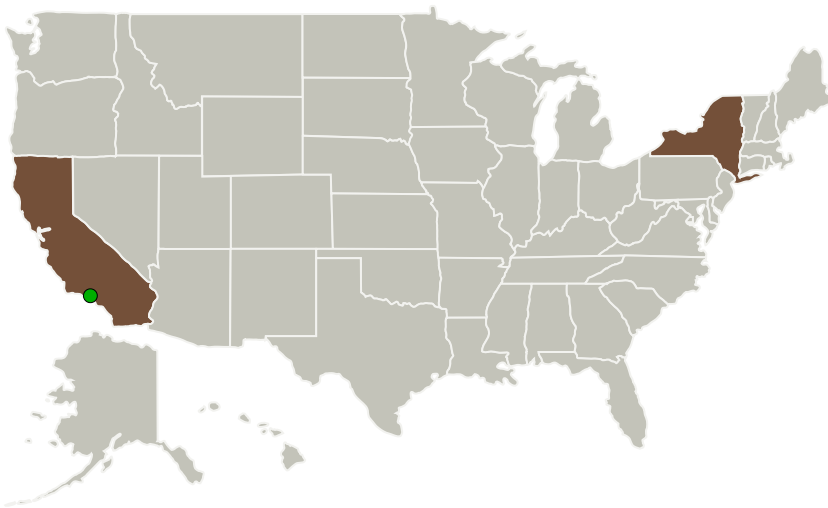
Completed Technology Project (2015 - 2017)



Project Introduction

During Phase 1, we investigated a number of blade designs for 2, 3, and 4 blade sampler geometries. We found that blades with small apex angles can penetrate harder formations with much lower energies. We propose to develop a 3 or 4 blade design for sampling much harder (4 MPa and more) material. During Phase 2 we will initially perform more extensive blade testing to determine optimum design, we will also investigate use of pyros to deploy blades, breadboard and test force neutral deployment and investigate One Resettable vs Multiple Samplers architectures. These studies will lead to 3 vs 4 blade architecture study (Tetrahedron Comet Sampler or TeCos and Pyramid Comet Sampler or PyCoS) and downselection. The TRL 4 TeCoS or PyCoS will then be build and tested. The results will be used to design TRL 5 system. The TRL prototype will then be build and tested in a range of analog materials from 5 DOF arm to mimic 2-3 DOF TAG arm and spacecraft movement.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Honeybee Robotics, Ltd.	Lead Organization	Industry	Pasadena, California
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



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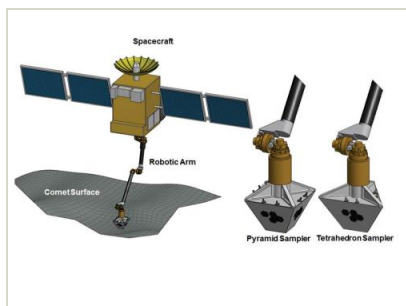


Primary U.S. Work Locations

California

New York

Images



Briefing Chart

Pyramid Comet Sampler Briefing Chart

(<https://techport.nasa.gov/image/126929>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Honeybee Robotics, Ltd.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Kris Zacny

Co-Investigator:

Kris Zacny

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Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX04 Robotic Systems
 - └ TX04.3 Manipulation
 - └ TX04.3.2 Grappling Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System